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IN THE CLAIMS

Applicant presents a listing of all claims.

1. (Original) Digital data conversion apparatus, comprising:

memory means for storing class data for respective classes at addresses corresponding to said respective classes, said class data being associated with reference interpolated data and a reference standard definition digital video signal for each of said respective classes, said reference standard definition digital video signal and said reference interpolated data constituting a reference high definition digital video signal;

means for receiving a standard definition digital video signal including a plurality of pixel data representing pixel values;

means for clustering said pixel data of said standard definition digital video signal to produce a class in accordance with the pixel values of said pixel data;

means for retrieving said class data from the one of said addresses of said memory means corresponding to said class of said standard definition digital video signal; and

means for generating a plurality of interpolated data in accordance with said standard definition digital video signal and said retrieved class data, in which a position of at least one of said clustered pixel data of said standard definition digital video signal is spatially located at the same position of at least one of said generated interpolated data.

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2. (Original) The digital data conversion apparatus as claimed in claim 1, wherein said class data includes a plurality of coefficient data; and

wherein said means for generating said plurality of interpolated data generates each of said interpolated data by adding respective products of a respective one of said coefficient data and a respective one of said pixel data.

3. (Original) The digital data conversion apparatus as claimed in claim 1, wherein the standard definition digital video signal is an orthogonally converted digital video signal and said means for receiving comprises means for decoding said orthogonally converted digital video signal to produce a decoded digital video signal.

4. (Original) The digital data conversion apparatus as claimed in claim 1, wherein said class data stored in said memory means corresponds to said interpolated data; and

wherein said means for generating is operable to generate said interpolated data by providing said retrieved class data as said interpolated data.

5. (Once Amended) A digital data conversion method, comprising the steps of:

storing class data for respective classes at addresses in a memory corresponding to said respective classes, said class data being associated with reference interpolated data and a reference standard definition digital video signal for each of said respective classes, said

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reference standard definition digital video signal and said reference interpolated data constituting a reference high definition digital video signal;

receiving a standard definition digital video signal, utilizing a receiving unit, including a plurality of pixel data representing pixel values;

clustering, utilizing a clustering unit, said pixel data of said standard definition digital video signal to produce a class in accordance with the pixel values of said pixel data;

retrieving said class data from the one of said addresses in said memory corresponding to said class of said standard definition digital video signal; and

generating, utilizing a generating unit, a plurality of interpolated data in accordance with said standard definition digital video signal and said retrieved class data, in which a position of at least one of said clustered pixel data of said standard definition digital video signal is spatially located at the same position of at least one of said generated interpolated data.

6. (Original) The digital data conversion method as claimed in claim 5, wherein said class data includes a plurality of coefficient data; and wherein the step of generating said plurality of interpolated data is carried out by adding respective products of a respective one of said coefficient data and a respective one of said pixel data.

7. (Original) The digital data conversion method as claimed in claim 5, wherein the standard definition digital video signal is an orthogonally converted digital video

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signal and the step of receiving further comprises decoding said orthogonally converted digital video signal to produce a decoded digital video signal.

8. (Original) The digital data conversion method as claimed in claim 5, wherein said class data stored in said memory corresponds to said interpolated data; and

wherein said step of generating said interpolated data is carried out by providing said retrieved class data as said interpolated data.

9. (Original) Digital data conversion apparatus for converting a video signal admitting of a first standard into a video signal admitting of a second standard, a resolution of said video signal admitting of said first standard being lower than a resolution of said video signal admitting of said second standard, comprising:

memory means for storing class data for respective classes at addresses corresponding to said respective classes, said class data being associated with reference output data and reference input data admitting of said first standard for each of said respective classes, said reference input data admitting of said first standard and said reference output data constituting a reference digital video signal admitting of said second standard;

means for receiving an input digital video signal including a plurality of pixel data and admitting of said first standard;

means for clustering said pixel data of said input digital video signal to produce a class in accordance with values of said pixel data;

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means for retrieving said class data from one of said addresses of said memory means corresponding to said class of said input digital video signal admitting of said first standard; and

means for generating a plurality of interpolated data in accordance with said input digital video signal and said class data which has been retrieved, said interpolated data and said input digital video signal constituting a signal admitting of said second standard, and wherein a position of at least one of said clustered pixel data of said input digital video signal is spatially located at the same position of at least one of said generated interpolated data.

10. (Original) The digital data conversion apparatus as claimed in claim 9, wherein said class data includes a plurality of coefficient data; and

wherein said means for generating said plurality of interpolated data is operable to generate each of said interpolated data by adding respective products of a respective one of said coefficient data and a respective one of said pixel data.

11. (Original) The digital data conversion apparatus as claimed in claim 9, wherein said class data stored in said memory means corresponds to said interpolated data; and

wherein said means for generating is operable to generate said interpolated data by providing said retrieved class data as said interpolated data.

12. (Original) The digital data conversion apparatus as claimed in claim 9, further comprising means for generating said class data stored in said memory means.

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13. (Original) Digital data conversion apparatus, comprising:

means for generating class data associated with reference interpolated data and reference standard definition digital video signal for each of a plurality of respective classes, said reference standard definition digital video signal and said reference interpolated data constituting a reference high definition digital video signal;

memory means for storing said class data for said respective classes of addresses corresponding to said respective classes;

means for receiving a standard definition digital video signal having a plurality of pixel data;

means for clustering said pixel data of said standard definition digital video signal to produce a class in accordance with values of said pixel data;

means for retrieving said class data from the one of said addresses of said memory means corresponding to said class of said standard definition digital video signal; and

means for generating a plurality of interpolated data in accordance with said standard definition digital video signal and said retrieved class data, in which a position of at least one of said clustered pixel data of said standard definition digital video signal is spatially located at the same position of at least one of said generated interpolated data.

14. (Once Amended) A digital data conversion method, comprising the steps of:

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generating class data, utilizing a generating unit, associated with reference interpolated data and a reference standard definition digital video signal for each of a plurality of respective classes, said reference standard definition digital video signal and said reference interpolated data constituting a reference high definition digital video signal;

storing said class data for said respective classes at addresses in a memory corresponding to said respective classes;

receiving, at a receiving unit, a standard definition digital video signal having a plurality of pixel data;

clustering, utilizing a clustering unit, said pixel data of said standard definition digital video signal to produce a class in accordance with values of said pixel data;

retrieving said stored class data from the one of said addresses corresponding to said class of said standard definition digital video signal; and

generating, utilizing a generating unit, a plurality of interpolated data in accordance with said standard definition digital video signal and said retrieved class data, in which a position of at least one of said clustered pixel data of said standard definition digital video signal is spatially located at the same position of at least one of said generated interpolated data.

15. (New) A digital signal conversion apparatus for converting a first digital image signal to a second digital image signal having a high resolution component, comprising:

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a memory for storing class data for respective classes at addresses corresponding to said respective classes, said class data obtained on the basis of at least a digital image signal having said high resolution component;

means for receiving said first digital image signal including pixel data representing pixel values;

means for clustering a plurality of pixel data of said first digital image signal adjacent to a pixel data of said second digital image signal to produce a class, a bit number of said pixel data of said first digital image signal being reduced;

means for retrieving said class data from one of said addresses of said memory corresponding to said class of said first digital image signal; and

means for generating all of pixel data, representing pixel values of said second digital image signal, in the same manner in accordance with a common algorithm based upon at least said retrieved class data in which a position of at least one of said clustered pixel data is spatially located at the same position of at least one of said generated data.

16. (New) The digital signal conversion apparatus as claimed in claim 15, wherein said class data includes a plurality of coefficient data; and wherein said means for generating said pixel data representing pixel values of said second digital image signal generates each of said pixel data representing pixel values of said second digital image signal in accordance with the plurality of coefficient data and a plurality of pixel data of said first digital image signal.

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17. (New) The digital signal conversion apparatus as claimed in claim 15, wherein the first digital image signal is an orthogonally converted digital image signal and said means for receiving comprises means for decoding said orthogonally converted digital image signal to produce a decoded digital image signal.

18. (New) The digital signal data conversion apparatus as claimed in claim 15, wherein said class data stored in said memory corresponds to said pixel data representing pixel values of said second digital image signal; and wherein said means for generating is operable to generate said pixel data representing pixel values of said second digital image signal by providing said retrieved class data as said pixel data representing pixel values of said second digital video signal.

19. (New) A digital signal data conversion method for converting a first digital image signal to a second digital image signal having a high resolution component, comprising the steps of:

storing class data for respective classes at addresses in a memory corresponding to said respective classes, said class data obtained on the basis of at least a digital image signal having said high resolution component;

receiving, utilizing a receiving unit, said first digital image signal including pixel data representing pixel values;

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clustering, utilizing a clustering unit, a plurality of pixel data of said first digital image signal adjacent to a pixel data of said second digital image signal to produce a class, a bit number of said pixel data of said first digital image signal being reduced;

retrieving said class data from one of said addresses of said memory corresponding to said class of said first digital video signal; and

generating, utilizing a generating unit, all of pixel data, representing pixel values of said second digital image signal, in the same manner in accordance with a common algorithm based upon at least said retrieved class data in which a position of at least one of said clustered pixel data is spatially located at the same position of at least one of said generated data.

20. (New) The digital signal conversion method as claimed in claim 19, wherein said class data includes a plurality of coefficient data; and

wherein the step of generating said pixel data representing pixel values of said second digital video signal generates each of said pixel data representing pixel values of said second digital image signal in accordance with the plurality of coefficient data and a plurality of pixel data of said first digital image data.

21. (New) The digital signal conversion method as claimed in claim 19, wherein the first digital image signal is an orthogonally converted digital image signal and the step of receiving further comprises decoding said orthogonally converted digital image signal to produce a decoded digital image signal.

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22. (New) The digital signal conversion method as claimed in claim 19, wherein said class data stored in said memory corresponds to said pixel data representing pixel values of said second digital image signal and

wherein said step of generating said pixel data representing pixel values of said second digital image signal is carried out by providing said retrieved class data as said pixel data representing pixel values of said second digital image signal.

23. (New) A digital signal conversion apparatus for converting a digital video signal admitting of a first standard into a digital video signal admitting of a second standard, a first resolution of said digital video signal admitting of said first standard being lower than a second resolution of said digital video signal admitting of said second standard, comprising:

a memory for storing class data for respective classes at addresses corresponding to said respective classes, said class data obtained on the basis of at least a digital video signal admitting of said second standard having said second resolution;

means for receiving an input digital video signal including pixel data and admitting of said first standard;

means for clustering a plurality of pixel data of said input digital video signal adjacent to a pixel data of a digital video signal admitting of said second standard to produce a class, a bit number of said pixel data of said input digital video signal being reduced;

means for retrieving said class data from one of said addresses of said memory corresponding to said class of said input digital video signal admitting of said first standard;

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means for generating all of pixel data, representing pixel values of said digital video signal admitting of said second standard, in the same manner in accordance with a common algorithm based upon at least said class data which has been retrieved in which a position of at least one of said clustered pixel data of said digital video signal admitting of said first standard is spatially located at the same position of at least one of said generated data.

24. (New) The digital signal conversion apparatus as claimed in claim 23, wherein said class data includes a plurality of coefficient data; and

wherein said means for generating said pixel data representing pixel values of said digital video signal admitting of said second standard is operable to generate each said pixel data representing pixel values of said digital video signal admitting of said second standard in accordance with the plurality of coefficient data and a plurality of pixel data of said digital video signal admitting of said first standard.

25. (New) The digital signal conversion apparatus as claimed in claim 23, wherein said class data stored in said memory corresponds to said pixel data representing pixel values of said digital video signal admitting of said second standard and

wherein said means for generating is operable to generate said pixel data representing pixel values of said digital video signal admitting of said second standard by providing said retrieved class data as said pixel data representing pixel values of said digital video signal admitting of said second standard.

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26. (New) The digital signal conversion apparatus as claimed in claim 23, further comprising means for generating said class data stored in said memory.

27. (New) A digital signal conversion apparatus for converting a standard definition digital video signal to a high definition digital video signal, comprising:

a memory for storing class data for respective classes at addresses corresponding to said respective classes, said class data obtained on the basis of at least a digital video signal having a high resolution component;

means for receiving said standard definition digital video signal having pixel data representing pixel values;

means for clustering a plurality of pixel data of said standard definition digital video signal adjacent to a pixel data of said high definition digital video signal to produce a class, a bit number of said pixel data of said standard definition digital video signal being reduced;

means for retrieving said class data from one of said addresses of said memory corresponding to said class of said standard definition digital video signal; and

means for generating all of pixel data, representing pixel values of said high definition digital video signal, in the same manner in accordance with a common algorithm based upon at least said retrieved class data in which a position of at least one of said clustered pixel data of said standard definition digital video signal is spatially located at the same position of at least one of said generated data.

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28. (New) The digital signal conversion apparatus as claimed in claim 27, wherein said class data includes a plurality of coefficient data; and

wherein said means for generating the pixel data representing pixel values of said high definition digital video signal generates each of said pixel data representing values of said high definition digital video signal in accordance with the plurality of coefficient data and a plurality of pixel data of said standard definition digital video signal.

29. (New) The digital signal conversion apparatus as claimed in claim 28, wherein said class data stored in said memory corresponds to said pixel data representing pixel values of said high definition digital video signal; and

said means for generating is operable to generate said pixel data representing pixel values of said high definition digital video signal by providing said retrieved class data as said pixel data representing pixel values of said high definition digital video signal.

30. (New) A digital signal conversion method, comprising the steps of:

storing class data for respective classes at addresses in a memory corresponding to said respective classes, said class data obtained on the basis of at least a digital video signal having a high resolution component;

receiving, at a receiving unit, a standard definition digital video signal having pixel data representing pixel values;

clustering, utilizing a clustering unit, a plurality of pixel data of said standard definition digital video signal adjacent to a pixel data of a high definition digital video signal to

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produce a class, a bit number of said pixel data of said standard definition digital video signal being reduced;

retrieving said stored class data from one of said addresses corresponding to said class of said standard definition digital video signal; and

generating, utilizing a generating unit, all of pixel data, representing pixel values of said high definition digital video signal, in the same manner in accordance with a common algorithm based upon at least said retrieved class data in which a position of at least one of said clustered pixel data of said standard definition digital video signal is spatially located at the same position of at least one of said generated data.

31. (New) The digital signal conversion method as claimed in claim 30, wherein said class data includes a plurality of coefficient data; and wherein said step for generating the pixel data representing pixel values of said second output digital video signal generates each of said pixel data representing values of a high definition video signal in accordance with the plurality of coefficient data and a plurality of pixel data of said standard definition digital video signal.

32. (New) The digital signal conversion method as claimed in claim 30, wherein said stored class data corresponds to said pixel data representing pixel values of said second output digital video signal; and said step for generating is operable to generate said pixel data representing pixel values of said second output digital video signal by providing said

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retrieved class data as pixel data representing pixel values of a high definition digital video signal.

33. (New) A digital data conversion apparatus for converting a first digital image signal to a second digital image signal having a high resolution component, comprising:

a memory for storing class data for respective classes at addresses corresponding to said respective classes, said class data obtained on the basis of at least digital image data having said high resolution component;

means for receiving said first digital image signal including pixel data representing pixel values;

means for clustering a plurality of pixel data of said first digital image signal adjacent to a plurality of pixel data of said second digital image signal to produce a class, a bit number of said pixel data of said first digital image signal being reduced and said class being used to retrieve a class data to generate a plurality of pixel data representing pixel values of said second digital image signal;

means for retrieving said class data from addresses of said memory corresponding to said class of said first digital image signal; and

means for generating all of said pixel data, representing pixel values of said second digital image signal, in the same manner in accordance with a common algorithm based upon at least said retrieved class data in which a position of at least one of said clustered pixel data is spatially located at the same position of at least one of said generated data.

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34. (New) The digital data conversion apparatus as claimed in claim 33, wherein said class data includes a plurality of coefficient data; and

wherein said means for generating the plurality of pixel data representing pixel values of said second digital image signal generates each of said pixel data representing values of said second digital image signal in accordance with the plurality of coefficient data and a plurality of pixel data representing pixel values of said first digital image data.

35. (New) The digital data conversion apparatus as claimed in claim 33, wherein said class data stored in said memory corresponds to said pixel data representing pixel values of said second digital image signal; and

said means for generating is operable to generate said pixel data representing pixel values of said second digital image signal by providing said retrieved class data as said pixel data representing pixel values of said second digital image signal.

36. (New) A digital data conversion method for converting a first digital image signal to a second digital image signal having a high resolution component, comprising the steps of:

storing class data for respective classes at addresses in a memory corresponding to said respective classes, said class data obtained on the basis of at least digital image data having said high resolution component;

receiving, at a receiving unit, said first digital image signal including pixel data representing pixel values;

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clustering, utilizing a clustering unit, a plurality of pixel data of said first digital image signal adjacent to a plurality of pixel data of said second digital image signal to produce a class, a bit number of said pixel data of said first digital image signal being reduced and said class being used to retrieve a class data to generate a plurality of pixel data representing pixel values of said second digital image signal;

retrieving said class data from addresses of said memory corresponding to said class of said first digital image signal; and

generating, utilizing a generating unit, all of said pixel data, representing pixel values of said second digital image signal, in the same manner in accordance with a common algorithm based upon said retrieved class data in which a position of at least one of said clustered pixel data is spatially located at the same position of at least one of said generated data.

37. (New) The digital data conversion method as claimed in claim 36, wherein said class data includes a plurality of coefficient data; and wherein said step for generating the plurality of pixel data representing pixel values of said second digital image signal generates each of said pixel data representing values of said second digital image signal in accordance with the plurality of coefficient data and a plurality of pixel data representing pixel values of said first digital image data.

38. (New) The digital data conversion method as claimed in claim 36, wherein said class data stored in said memory corresponds to said pixel data representing pixel values of said second digital image signal; and

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said step for generating is operable to generate said pixel data representing pixel values of said second digital image signal by providing said retrieved class data as said pixel data representing pixel values of said second digital image signal.

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